DO AGE AND SEX OF SCHOOL STUDENTS MAKE SIGNIFICANT DIFFERENCE IN THEIR MULTIPLE INTELLIGENCES?

By

R. RAVI*   **S. GETHSI VEDAPRIYA****

* Assistant Professor, Department of Education, Karunya University, Coimbatore.
** Science Teacher, Govt. Hr. Sec. School, Coimbatore.

ABSTRACT

Multiple Intelligences are a new Educational Theory proposed by Howard Gardner in 1983. Multiple intelligences describe an array of different kinds of intelligences exhibited by human beings. This theory consists of verbal-linguistic, logical and mathematics, visual and spatial, badily kinesthetic, musical-rhythmic, intra-personal, inter-personal, natural and existentialist intelligences. According to Gardner, each individual manifests varying levels of these different intelligences, and thus each person has a unique cognitive profile. Recently, there are numerous researches which are being conducted in the area of multiple intelligences. The present study was carried out to find out the difference in multiple intelligences between male and female and between different age groups among school students by employing survey method. The data was collected using Multiple Intelligences Inventory from 463 school students from seven different schools in and around of Coimbatore, out of which 224 are girls and 239 are boys. The collected data were scrutinized and analyzed with the help of SPSS and statistical techniques like central tendency and independent sample t-test were worked out for meaningful findings and conclusion. Finally, the study concludes that the variables age and sex of the selected school students does make significant difference, except some core intelligences.

Keywords: Age and Multiple Intelligences, Sex and Multiple Intelligences, Multiple intelligences and School Students, Demographic Factors and Multiple Intelligences.

INTRODUCTION

Multiple Intelligences are an educational theory, developed by Howard Gardner that describes an array of different kinds of "intelligences" exhibited by human beings. Howard Gardner claims that all human beings have multiple intelligences. These multiple intelligences can be nurtured and strengthened, or ignored and weakened. He believes each individual has nine intelligences. Gardner originally identified seven core intelligences viz., linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal and intrapersonal. In 1999 he added an eighth, namely naturalistic intelligence, and indicated that investigation continues on whether there is an existential intelligence. The following are the meaning for nine core multiple intelligences:

- Verbal - Linguistic Intelligence: The ability to read, write and cammunicate with words.

- Logical-Mathematical Intelligence: The ability to reason and calculate, to think things through in a logical, systematic manner.

- Visual-Spatial Intelligence: The ability to think in pictures, visualize a future result. To imagine things in the mind's eye.

- Musical Intelligence: The ability to make or compose music, to sing well, or understand and appreciate music.

- Bodily-Kinesthetic Intelligence: The ability to use the body skillfully to solve problems, create products or present ideas and emotions.

- Inter-personal (Social) Intelligence: The ability to work effectively with others, to relate to other people, and display empathy and understanding, to notice their motivations and goals.

- Intra-personal Intelligence: The ability for self-analysis and reflection to be able to quietly contemplate and

assess one's accomplishments, to review one's behavior and innermost feelings, to make plans and set goals, the capacity ta know aneself.

- *Naturalistic Intelligence:* The ability to recognize flora and fauna, ta make ather cansequential distinctians in the natural world and to use this ability praductively.

- *Existential Intelligence:* The ability ta tackle deep questions about human existence, such as the meaning of life, why we die, and what our role is in the warld. This intelligence seeks cannectians ta real world and allows learners ta see their place in the big picture and observe their roles in the classroom, society and the world ar the universe.

Scope, Background and Significance of the Study

Gardner's multiple intelligence theory opened new vistas far educational researchers. Gardner (1983, 1999) argued that despite the success of standard IQ in predicting ability in school subjects, it did not highlight the potential or competence of an individual in particular fields af expertise. But multiple intelligences are praviding multiple ways for learning. Gardner's theory of multiple intelligences identifies nine subtypes of intelligence that every narmal individual shauld develap ta same extent. Generally, intelligence refers ane's awn ability ta accommodate him / her to the situation. But multiple intelligences refers how or the way to adapt to the situatian. Accarding ta Gardner, every human being consist of anyone or more of the intelligences among the identified nine categaries and hence, all are intellectuals. Mare sa, since multiple intelligences pravide multiple ways for learning, it is easy for bath students and teachers for teaching and learning a concept or unit through anyone of the subtypes of multiple intelligences which is mare apprapriate far them.

Research reviews suggest significant gender and age differences in intelligence. Anastasi (1958), Tyler (1965), and Maccoby (1966) have reported male performance increased with age on tests of mathematical reasoning campared ta females. Hagan (1978) reparted that in a review of 11 studies more than half of the studies demonstrated significant differences between male and female self-estimates of IQ levels. Hogan argued that women tend to be perceived as less intelligent than men. Beloff (1992) canducted a study af Scattish students, it was nated that wamen underestimated while men overestimated their own intelligence along spatial and logical components. Even the estimates of parental, grandparental, and sibling IQ favared males as brathers, fathers, and sans as mare intelligent than sisters, mathers, and daughters respectively (Byrd and Stacey, 1993; Furnham and Rawles, 1995; Furnham et al., 1999b).

Similarly, there are a few research reviews suggesting sex and age differences in multiple intelligences alsa. Far instance, Furnham, A et.al. (1999), reported in their study that only one (mathematical/logical) showed a significant sex difference, with males believing that they had higher scares than females. Furnham, A and Fukumata, S (2008) conducted a study on 198 Japanese Parents (both father and mother) own and their children's estimation of intelligence and multiple intelligences. The results indicated that males (fathers) rated their own overall general intelligence and Gardner's seven multiple intelligences significantly higher than females (mathers). Further significant difference in sex was faund amang children when parents rated their sons and daughters.

Yuen and Furnham, A (2006) reported that there was sex difference in eight of the 10 multiple intelligences except verbal and interpersonal. Further it is noted that male participants gave higher scares than female participants. Furnham, Emma and Salima (2002) investigated on 156 British adult participants who were asked to rate themselves an multiple intelligences and faund that men's were significantly higher than women's. In the same study, it is found that sons had significantly higher than their daughters when parents are asked ta estimate their children's multiple intelligences. Furnham and Akande (2004) conducted a study on 421 parents from four South African countries (Namibia, South Africa, Zambia and Zimbabwe) wha were asked ta estimate their awn and their children's multiple intelligences and it was found that females gave higher self-estimates than males on all seven multiple intelligences and the same was reflected in the estimatian of their children: females gave higher

scores than males. Loori (2005) found differences in multiple intelligences between male and female students learning English as a second language at higher institutions in USA.

Thus, the previous researches show that multiple intelligences are influenced by certain demographic, socio-economical, psychological and technological factors. There are numerous studies that are being conducted in the area of multiple intelligences in relation to these factors. In the present study, the investigators consider the influence of demographic factors viz., sex and age on multiple intelligences among school students. Further, in the present investigation only eight subtypes of multiple intelligences such as verbal or linguistic, logical-mathematical, visual or spatial, bodily-kinesthetic, musical, inter-personal, intra-personal and naturalistic intelligences are considered.

Design of the Study

Since the major objectives of the study is to find out the significant difference in multiple intelligences based on age and sex of the school students, the normative survey research design is adopted. The data was collected from 463 school students who were studying 8th, 10th and 12th from Matriculation, Govt. Aided and Govt. Higher Secondary Schools out of which 224 boys and 239 girls.

Tools Used for the Study

The following tools were developed and validated by the investigators to collect the data from the selected school students.

1. General Information proforma (English version)

2. Multiple Intelligence Test Battery (English version)

Multiple Intelligence Test Battery

The Multiple Intelligences Test Battery is in English version, which is developed and standardized by the investigators to measure eight subtypes of multiple intelligences of the school students whose ages are between 11 to 18 years. This test battery was standardized using Item Analysis technique to scrutinize the items and split-off method to find out the reliability as well as validity. This test battery consists of 76 items. Each item carries a rating viz., Always (3), Sometimes (2) and Never (1). There is no time limit to

complete this, however the students were asked to try to complete fast and not to spend more time to complete the test.

Validity and Reliability of the Tool

The test battery was standardized using Item Analysis technique to scrutinize the items. The investigators prepared the items based on MI theory. In the beginning, 95 items are generated. Then after having a thorough discussion with some experts, a few items were deleted and finally it came down to 90 items that are given to the students for the purpose of reliability and validity. The data was collected from 90 samples from 8th, 10th and 12th standard students. The split-off method was adopted. After the analysis, the r-value 0.7 and above of the items are considered for final data collection. Some items which were having 0.5 to 0.6 were reworded and rephrased and finally the test battery consisted of 76 items in eight dimensions of multiple intelligences (Table 1).

The maximum possible score is 228 and the minimum possibility is 76.

Results and Interpretations

Hypothesis 1:

There will be a significant mean score difference in Multiple intelligences between male and female students.

Table 2 shows the mean score difference in multiple intelligences between boys and girls among the selected school students. According to the results of independent sample 't'-test, except intra-personal and verbal or linguistic intelligences, the other six intelligences viz.,

Sl.No.	Sub Test	No of Items
1	Verbal/Linguistic Intelligence	10
2	Logical/Mathematical Intelligence	10
3	Visual/ spatial Intelligence	10
4	Bodily/Kinesthetic Intelligence	10
5	Musical/Rhythmic Intelligence	10
6	Interpersonal Intelligence	9
7	Intrapersonal Intelligence	10
8	Naturalistic Intelligence	7

Table 1. Multiple Intelligences Test Battery

Variable	Category	N	Mean	Std Deviation	't'- test	df	Level of significance
Verbal or Linguistic Intelligence	Male	224	17.71	2.77	0.279	461	Not significant
	Female	239	17.64	2.59			
Logical or Mathematical Intelligence	Male	224	15.27	2.61	3.156	461	0.01
	Female	239	16.06	2.77			
Visual or Spatial Intelligence	Male	224	17.97	3.70	2.109	461	0.05
	Female	239	18.64	3.19			
Bodily or Kinesthetic Intelligence	Male	224	18.30	2.86	2.134	461	0.05
	Female	239	18.91	3.21			
Musical or Rhythmic Intelligence	Male	224	17.93	3.69	4.163	461	0.01
	Female	239	19.37	3.72			
Inter personal Intelligence	Male	224	13.29	2.65	2.581	461	0.05
	Female	239	13.90	2.43			
Intra personal Intelligence	Male	224	16.67	2.58	0.050	461	Not significant
	Female	239	16.66	2.95			
Naturalistic Intelligence	Male	224	9.96	2.18	2.051	461	0.05
	Female	239	10.37	2.10			

Table 2. Mean score difference in Multiple Intelligences between male and female students.

logical or mathematical, visual or spatial, bodily kinesthetic, musical, interpersonal and naturalistic intelligence are statistically significant at 0.05 and 0.01 level. Hence, it is concluded that the factor sex does not make any significant differences in intrapersonal and verbal / linguistic intelligences.

Hypothesis 2:

There will be a significant mean score difference in Multiple Intelligences between age group 11-14 years and 15-19 years students.

Table 3 shows the mean score difference in multiple intelligences between the age group 11-14 years and 15-19 years among the selected school students. As per the results obtained from independent sample 't'-test, it is noted that verbal/linguistic intelligence and musical intelligence are statistically significant at 0.01 level and intra personal intelligence is statistically significant at 0.05 level, whereas the remaining intelligences are not significant at 0.05 level. Hence it is concluded that the factor age does not make any significant difference in the mean scores obtained by the samples in various subtypes of multiple intelligences except verbal/linguistic, bodily kinesthetic and intra-personal intelligences.

Conclusion

From the results and interpretations of the present study, it is observed that the factors age and sex play a vital role in multiple intelligences. Most of the previous studies showed the gender difference on some types of multiple intelligences. Furnham, 2000 and 2001; Furnham and Bagumo, 1999; Furnham et.al., 1999c conducted and found the gender difference in spatial and logical components of multiple intelligence. In the present investigation, the independent sample 't'-test showed the same including other components of multiple intelligences but not in verbal and intra-personal components. Further, the previous researches like

Variable	Category (Age in years)	N	Mean	Std Deviation	t- test	df	Level of significance
Verbal or Linguistic Intelligence	11 - 14	208	18.04	2.55	2.701	461	0.01
	15 - 19	255	17.37	2.74			
Logical or Mathematical Intelligence	11 - 14	208	15.51	2.54	1.221	461	Not significant
	15 - 19	255	15.82	2.85			
Visual or Spatial Intelligence	11 - 14	208	18.55	3.30	1.297	461	Not significant
	15 - 19	255	18.13	3.58			
Bodily or Kinesthetic Intelligence	11 - 14	208	18.71	3.08	0.610	461	Not significant
	15 - 19	255	18.54	3.05			
Musical or Rhythmic Intelligence	11 - 14	208	19.36	3.58	3.557	461	0.01
	15 - 19	255	18.12	3.84			
Inter personal Intelligence	11 - 14	208	13.54	2.47	0.500	461	Not significant
	15 - 19	255	13.66	2.63			
Intra personal Intelligence	11 - 14	208	16.95	2.62	1.966	461	0.05
	15 - 19	255	16.44	2.88			
Naturalistic Intelligence	11 - 14	208	10.18	1.97	0.027	461	Not significant
	15 - 19	255	10.17	2.28			

Table 3. Mean score difference in Multiple intelligences between age group 11-14 years and 15-19 years students.

Furnham et.al. (1999); Chan (2006); Furnham and Fukumoto (2008); Yuen and Furnham (2006); Furnham, Emma and Salima (2002); Furnham and Akande (2004) and Loori (2005) indicated that the factor sex makes significant difference in multiple intelligences. Similarly, in the present study, the factor sex makes significant difference in multiple intelligences but except intra-personal and verbal or linguistic intelligences.

But the factor age is not like as sex, because it does not make significant difference in many of the subtypes of multiple intelligences except verbal/linguistic, badily kinesthetic and intra-personal intelligences. But this is true because generally these variables depend upon the individuals external exposures whereas the remaining subtypes like lagical ar mathematical, visual ar spatial, musical, inter-personal and natural intelligences depend upon the internal forces or inner drives of the individual and probably ther will not be changes based on the chronological ages. Finally, it is concluded that the factor sex makes significant difference in subtypes of multiple intelligences viz., lagical ar mathematical, visual ar spatial, musical, inter-personal, bodily kinesthetic and natural intelligences and does not makes difference in verbal ar linguistic and intra-persanal intelligences amang the selected schaal students. The factar age daes make significant difference only in verbal or linguistic, musical and intra-personal intelligences but not in other types viz., lagical, visual ar spatial, badily kinesthetic, inte-rpersanal and natural intelligences among the selected school students.

References

[1]. Anastasi, A. (1958). *Differential Psychology.* 3rd Ed. New York: Macmillan.

[2]. Beloff, H. (1992). "Mother, father and Me: Our IQ." *The Psychologist,* 5: 309-311.

[3]. Byrd, M. and B. Stacey. (1993). "Bias in IQ perception."

The Psychologist, 6: 16.

[4]. Chan, W. David (2006). Perceived Multiple Intelligences among Male and Female Chinese Gifted Students in Hong Kong: The Structure of the Student Multiple Intelligences Profile. *Gifted Child Quarterly*, Vol. 50, No. 4, 325-338

[5]. Furnham, A. and Rawles (1995). "Sex Differences in the Estimation of Intelligence." *Journal of Social Behavior and Personality,* 10: 741-745.

[6]. Furnham, A and Baguma, P (1999). A Cross-Cultural Study from three Countries of Self-estimates of Intelligence. *North American Journal of Psychology*, 1: 69 78.

[7]. Furnham, A, Clark, K and Bailey, K (1999). "Sex Differences in Estimates of Multiple Intelligences." *European Journal of Personality,* 13: 247-259.

[8]. Furnham, A., Fong, G. and Martin, N. (1999b). "Sex ond Cross-Cultural Differences in the Estimated Multi-Faceted Intelligence Quotient Score for Self, Porents and Siblings", *Personality and Individual differences*, 26: 1025-1034.

[9]. Furnham, A, Rakow, T, Sarmany-Schille, I and de Fruyt, F (1999c). "European Differences in Self- Perceived multiple Intelligences." *European Psychologist,* 4: 131-138.

[10]. Furnham, A (2000). Thinking about Intelligence. *The Psychologist,* 13: 510-515

[11]. Furnham, A (2001). Self-estimates of Intelligence. *Personality and Individual Differences*, 31: 1381 1405.

[12]. Furnham, A, Shahidi, S and Baluch, B (2002). Sex ond Culture Differences in Perceptions of Estimoted Multiple Intelligence for Self and Family: A British-Iranian Comparison. *Journal of Cross-Cultural Psychology*, Vol. 33, No. 3, 270-285.

[13]. Furnham, A, Emma, R and Salima, B (2002). "Parents Think Their Sons ore Brighter than Their Daughters: Sex Differences in Parental Self-Estimations and Estimations of their Children's Multiple Intelligences." *The Journal of Genetic Psychology,* 163(1): 24-39.

[14]. Furnham, A and Akande, A (2004). African parents' estimates of their own and their children's multiple intelligences. *Current Psychology*, Vol. 22, Number 4, pp. 281-294.

[15]. Furnham, A and Bunclark, K (2006). Sex differences in parents' estimations of their own and their children's intelligence. *Intelligence*, Vol. 34, Issue 1, pp. 1-14.

[16]. Furnham, A and Fukumoto, S (2008). Joponese porents' estimates of their own and their children's multiple intelligences: Cultural modesty and moderate differentiation. *Japanese Psychological Research*, Vol. 50, Issue 2, pp. 63 - 76.

[17]. Gardner, H. (1983). *Frames of Mmind: A Theory of Multiple Intelligences.* London: Fontana Press.

[18]. Gardner, H. (1999). *Intelligence Reframed.* New York: Bosic Books.

[19]. Hogan, H. (1978). " IQ Self-Estimates of Moles and Females." *The Journal of Social Psychology,* 106: 137-138.

[20]. Loori, A (2005). Multiple Intelligences: A Comparative Study between the preferences of males and females. *Journal of Social Behavior and Personality*, (Vol. ond Issue Nos. are not known).

[21]. Maccoby, E.E. (1966). "Sex differences in Intellectuol Functioning", (pp. 25-55) in E.E. Maccoby (ed.), *The Development of Sex Differences*. Stanford, CA: Stanford Univ. Press.

[22]. Tyler, L. E. (1965). *The Psychology of Human Differences.* New York: Appleton-Century-Crofts.

[23]. Yuen, M and Furnham, A (2006). Sex differences in self-estimation of multiple intelligences among Hong Kong Chinese adolescents. *High Ability Studies,* Volume 16, Issue 2, pp. 187-199.

ABOUT THE AUTHORS

Dr. R. Ravi is working as an Assistant Professor in Education, Karunya University, Coimbatore. His area of specializations are Educational Technology, Educational Psychology and English Language Education. He is currently working in the area of Multiple Intelligences and their applications for teaching and learning purposes. He is available at uniravi@rediffmail.com

Mrs. S. Gethsi Vedapriya is working as a Science Teacher, Government Hr. Secondary School, Coimbatore.